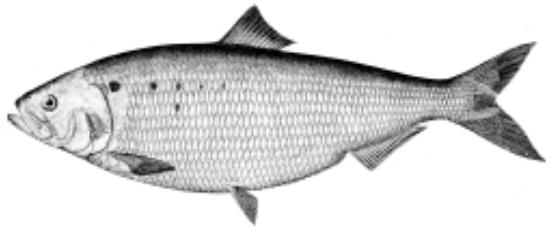

American Shad

by
John Kocik

The American shad, *Alosa sapidissima*, is an anadromous species which occurs along the Atlantic coast from southern Labrador to northern Florida. It also has been introduced along the Pacific Coast. American shad undergo extensive seasonal migrations, moving into rivers for spawning beginning in January in southern rivers, and continuing until July in the northernmost portion of their range. After spawning, shad migrate north along the coast to Canada where they feed during the summer. A southward migration occurs later along the continental shelf where the fish overwinter prior to spring spawning migrations to their natal rivers.

American shad have a range of life history patterns depending on their river of origin. In southern rivers, shad return to spawn at age 4 and die after spawning. Fecundity ranges from 300,000 to 400,000 eggs. Progressing northward, increasing numbers of spawners survive, the mean age at first spawning increases to 5, and fecundity decreases to 125,000 to 250,000 eggs.

Almost every major river along the Atlantic seaboard historically supported a spawning population of American shad. They have been exploited for their flesh and roe since prior to Euro-American settlement. Atlantic coast landings exceeded 22,000 mt in 1896. In contrast, commercial landings have averaged less than 1,350 mt annually since 1980. Since 1993, annual landings have exceeded 900 mt only once, in 1998. The principal gear used is the gillnet. Recreational angling is popular and catches may be significant, but no comprehensive estimates are available.

Excessive fishing has been blamed for historic declines in abundance in the Hudson and Connecticut Rivers, as well as in rivers in Maryland, North Carolina, and Florida. Throughout North America, dam construction along many larger rivers led to an almost complete disappearance of shad in many watersheds and the loss of associated fisheries. Pollution in the lower Delaware has been cited as the primary cause for the past decline of the fishery in that system.

The Atlantic States Marine Fisheries Commission has implemented a coastwide management plan for American shad and river herring to facilitate cooperative management and restoration plans between states. Restoration efforts have involved habitat improvement, fish passage, stocking, and transfer programs. Despite improved returns in some major river systems such as

the Susquehanna, Delaware and Connecticut Rivers, the range-wide abundance of American shad is well below historic levels.

A recent assessment characterized fishing mortality for 9 river stocks and resource trends for 13 river stocks of American shad. Total fishing mortality rates (river and coastal) were below the overfishing definition ($F_{30\%}$) for the 9 stocks that were evaluated. These results suggest that recent levels of exploitation in coastal intercept fisheries have not adversely impacted these stocks. In addition, juvenile shad production indices for 7 of these stocks suggest recruitment failure only in Maine. However, the total range of extant American shad populations includes additional populations in small river systems and small populations in larger river systems that are actively being restored. Also, much historical shad habitat is vacant and may be targeted for restoration in the future. For these stocks, individual states have developed fishing mortality targets to protect small stocks and rebuild others. Assessment studies have not quantitatively addressed these systems because of limited biological data. Like all mixed stock fisheries, small stocks can be at risk under conditions of uncertainty. Overall, this resource is considered to be fully exploited and at low levels of abundance.

For further information

Crecco, V.A. 1997. Stock assessment of American shad from selected Atlantic coast rivers. Atlantic States Marine Fisheries Commission, Washington, D.C. *ASMFC Spec. Rept.*

Gibson, M.R., V.A. Crecco, and D.L. Stang. 1988. Stock assessment of American shad from selected Atlantic coast rivers. Atlantic States Marine Fisheries Commission, Washington, D.C. *ASMFC Spec. Rept.* No. 15.

Summary Status

Long-term potential catch (MSY)	=	Unknown
Biomass corresponding to MSY	=	Unknown
Minimum biomass threshold	=	N/A
Stock Biomass in 1998	=	Unknown
F_{MSY}	=	Unknown
F_{TARGET}	=	N/A
Overfishing definition	=	$F_{30\%}$ = 0.39-0.48 depending on stock
$F_{1992-96}$	=	< $F_{30\%}$ range in all cases evaluated (Implies overfishing was not occurring)
Age at 50% maturity	=	2 to 5 years (varies by latitude)
Size at 50% maturity	=	40 cm (15.8 in.)
Assessment level	=	Index
Management	=	Interstate FMP for Shad and River Herring

M = varies by latitude **$F_{0.1}$=Variable** **F_{max} = Variable**

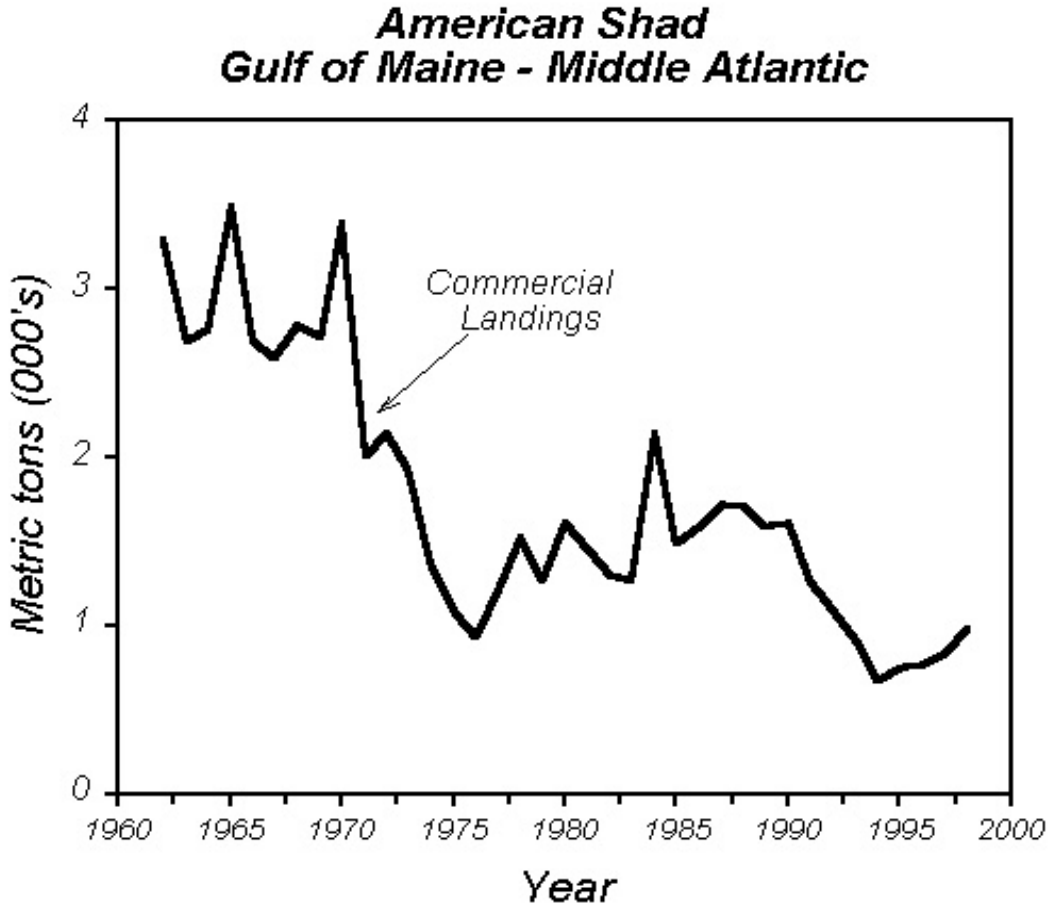

Table 35.1 Recreational catches and commercial landings (thousand metric tons)

	Year										
Category	**1979-88 average**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
U.S. recreational	-	-	-	-	-	-	-	-	-	-	-
Commercial											
United States	1.6	1.6	1.6	1.3	1.1	0.9	0.7	0.8	0.8	0.8	1.0
Canada	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-
Total nominal catch	1.6	1.6	1.6	1.3	1.1	0.9	0.7	0.8	0.8	0.8	1.0